

THE popularity of recorded music as an entertainment medium for all ages—the junior members of the family as well as mother and dad—continues at a high level. The average family usually has several radios about the house or apartment: a set in the living or dining room; perhaps a clock radio in one or more of the bedrooms; and probably a small a.c.-d.c. set in the kitchen.

A compact, inexpensive unit, which will utilize all of these sets to provide phonograph entertainment for all members of

# WIRELESS BROADCASTER

## FOR FAMILY RECORD ENTERTAINMENT

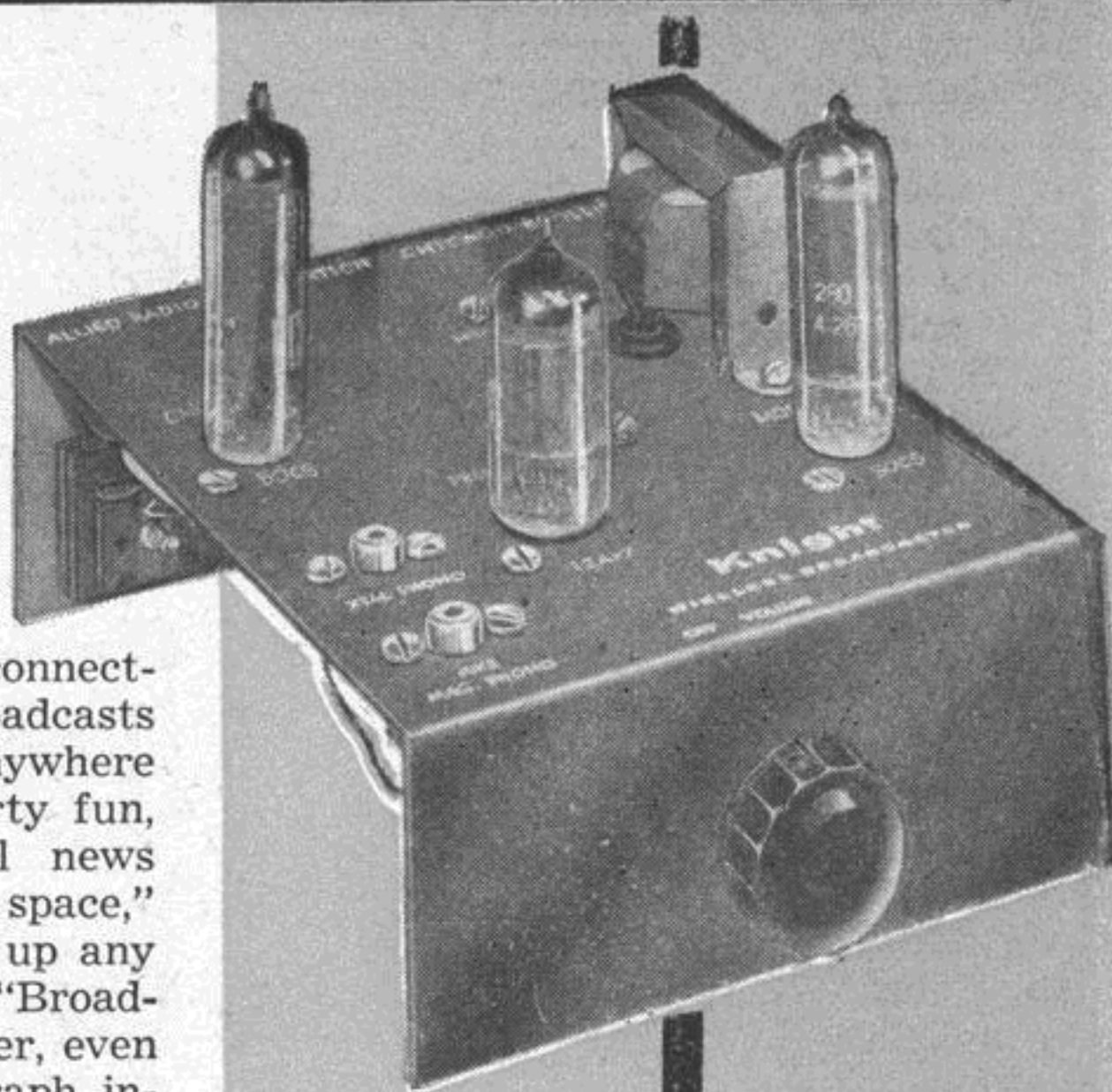
By  
**OTTO FRIED**

The "Wireless Broadcaster" assembled. Microphone and phono jacks are at left front, knob for volume control and power switch on apron, and frequency adjustment behind middle tube.

the family, is described here. By connecting a microphone to the unit, broadcasts may be made to a radio located anywhere in the house or apartment for party fun, family celebrations, etc. "Special news broadcasts," "signals from outer space," and a host of other gags will liven up any dull party or celebration. The "Broadcaster" can be used with any receiver, even though it does not have a phonograph input. The tedious job of installing and wiring phonograph input jacks on every set in the household is completely avoided.

Another unique, useful application is operating the unit as a radio nurse or an electronic baby sitter. It is only necessary to be within listening distance of a radio set. A high gain microphone or any five-inch PM speaker with its output transformer connected to the unit will monitor the necessary area. The "Wireless Broadcaster" is mounted in an out-of-reach place. Continuous operation over a long period of time will not damage the unit.

The *Knight* "Wireless Broadcaster" (available as a kit from *Allied Radio Corporation*) will work with almost any record player. A high impedance input for a crystal phono cartridge or a tuner and a high-gain input for a magnetic cartridge (*G-E*, *Pickering*, *Audax*) are provided. A crystal or high-impedance dynamic microphone may be connected to the high-gain input. A separate modulator stage permits almost



For party fun, to  
"keep an ear" on  
the baby, or to  
page the family



100 percent modulation. Negative feedback is used to minimize hum and distortion. The oscillator can be tuned in by any standard broadcast receiver, as it covers the range from 600 to 1600 kilocycles.

It is only necessary to adjust two controls for the proper operation of the unit. The oscillator frequency adjustment is easily accessible on top of the chassis. The volume control is mounted on the front apron.

Radiating the r.f. oscillator signal to any set in the average household presents no problem to the *Knight* "Wireless Broadcaster." FCC regulations provide that no license is needed for this type of device, as long as its working range is about 90 feet or less at the high frequency end of the broadcast band and increases to no more than about 250 feet at the low frequency end.

The complete unit is constructed on a single chassis. The circuit uses a 12AX7 tube for an equalized phono or a microphone preamplifier. This is followed by a 50C5 modulator. Another 50C5 generates the radio frequency carrier. A simple selenium rectifier circuit delivers the necessary B plus voltage.

The 50C5 ( $V_3$ ) stage operates as a highly stable, plate-tuned, feed-back oscillator. It is used as a triode. The r.f. output of the stage is developed across the oscillator tuning circuit, which consists of  $C_7$  and the primary of  $L_2$ .  $C_7$  is a special 470  $\mu\text{mfd}$ . trimmer capacitor. This part and the special oscillator coil,  $L_2$ , are available from *Allied Radio Corporation*.

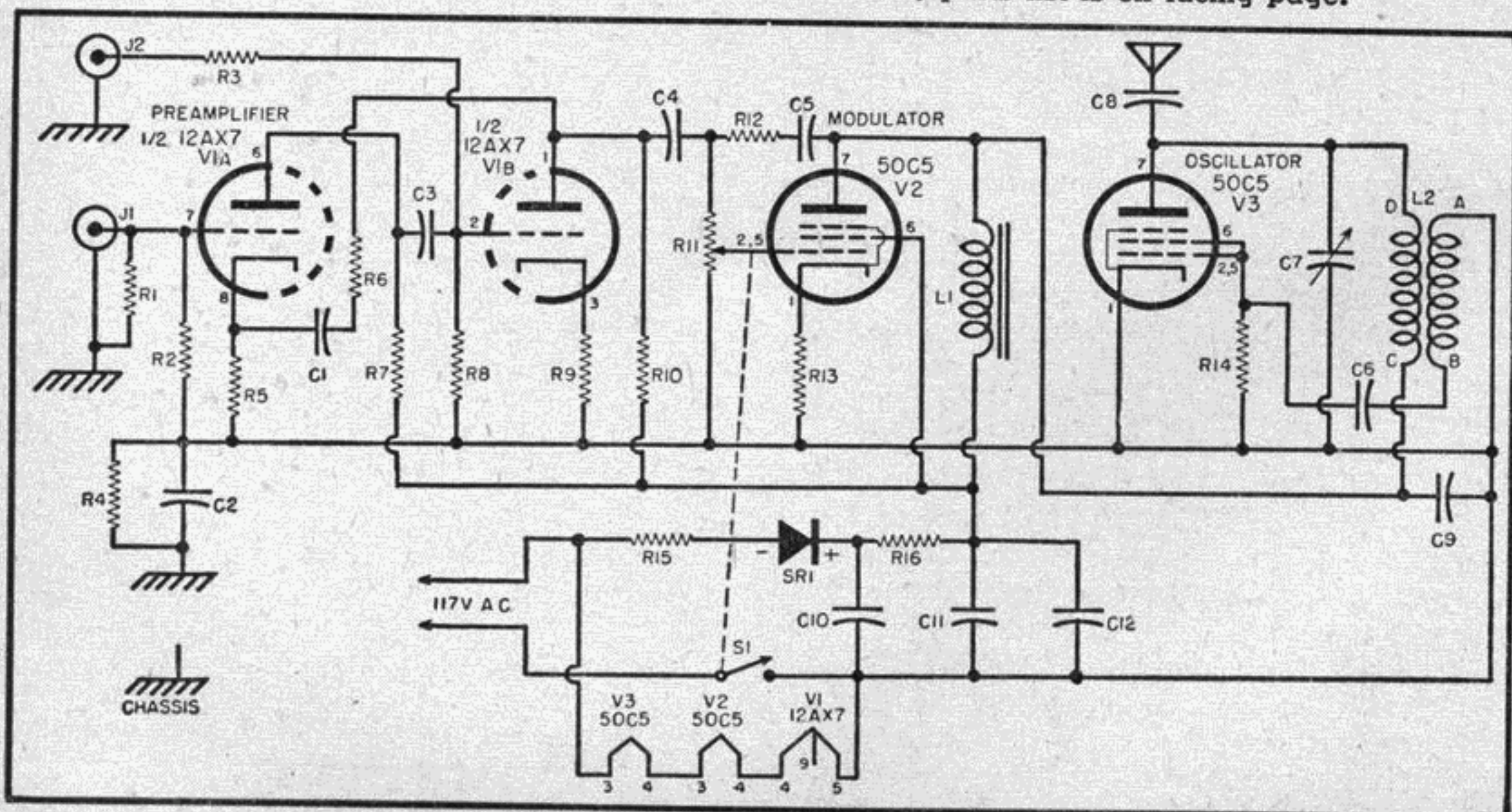
The phono jack,  $J_1$ , is used for low output magnetic cartridges (such as *G-E*, *Pickering*, *Audax*).  $R_1$  is the cartridge-

loading resistor. The gain provided by  $V_1$ , the preamplifier stage, and the modulator stage is sufficient to allow almost 100 percent modulation. A crystal cartridge may be connected to input jack,  $J_2$ . The 2.2 megohm resistor,  $R_3$ , provides sufficient attenuation for crystal cartridges which produce more than three volts output. If a ceramic or late model crystal pickup is being used, the volume may be low. In this case the resistor should be changed to 100,000 ohms. Any AM or FM tuner may be connected to this input. An equalizer circuit, which consists of  $R_6$  and  $C_1$ , is connected from the plate circuit of the second section of  $V_1$  to the cathode of the first section. It provides 6 db bass boost per octave.

The audio modulation is coupled from the second audio stage to the modulator grid by means of  $C_4$  and  $R_{11}$ . The setting of  $R_{11}$ , the volume control, controls the output of the modulator and thus the percentage of modulation of the r.f. carrier. The audio choke,  $L_1$ , is connected in a Heising modulation circuit. Because the choke is connected in series between the d.c. power supply and the oscillator, any audio signal that is developed across it is superimposed on the oscillator d.c. supply.

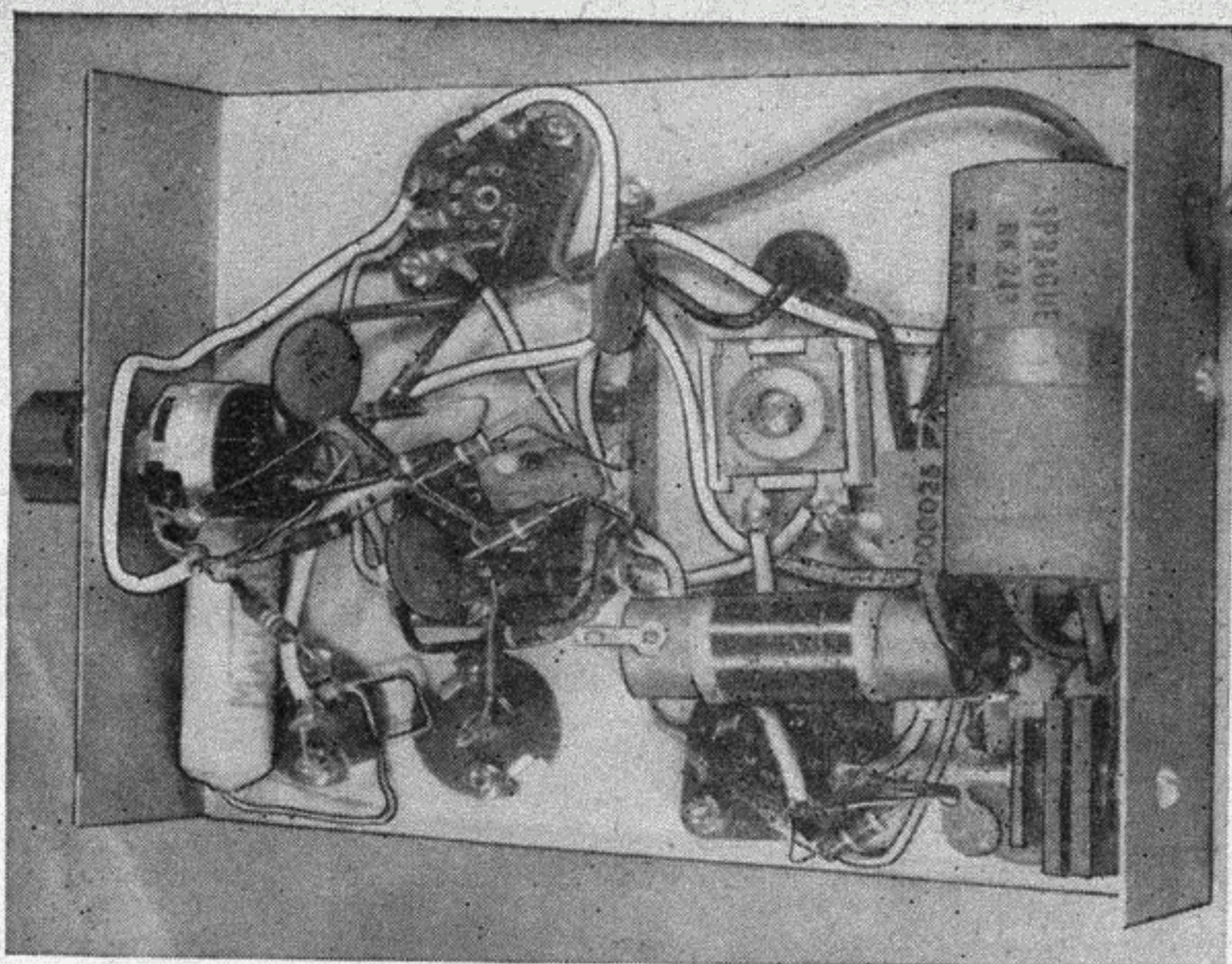
To reduce any hum or distortion in the 50C5 modulator, negative feedback is used. A portion of the output of the modulator is fed back to its own grid through  $C_5$  and  $R_{12}$ , the feedback network. Here, instead of allowing the kind of feedback that re-amplifies, as is used in the oscillator, the 4 to 6 db of negative feedback acts to reduce the output of this stage. However, it reduces hum and harmonic distortion very much more. Sufficient extra gain has been built

Schematic diagram of the "Wireless Broadcaster"; parts list is on facing page.





Bottom view of "Broadcaster." All parts can be placed conveniently on chassis approximately 6 inches by 5 inches.



into the circuit so that the small loss in amplification is recovered.

The power supply contains a half-wave selenium rectifier. The output is filtered by  $C_{10}$ ,  $R_{16}$ ,  $C_{11}$  and  $C_{12}$ .

Due to the simplicity of design, the construction of the *Knight* "Wireless Broadcaster" is very easy. A 6"x5"x2" chassis is large enough to accommodate all of the components without crowding. A pre-formed and punched chassis is available from *Allied Radio Corporation* as part of the complete *Knight* kit.

After the chassis wiring is completed, an antenna wire is soldered to  $C_8$ . It is advisable to begin with a ten-foot length of wire. When operating the "Broadcaster" close to a receiver, the antenna wire is rolled up. At distances farther away from

the receiver, the wire should be unrolled as needed. If more than one set is being used, the antenna length may be changed for best reception with all of the sets. It is best to use as short an antenna as possible to deliver a good signal.

Adjustment and operation is quite simple. First the unit is placed near the receiver being used. The receiver is tuned to any frequency between 600 and 1600 kilocycles where no signal is heard. A record player, microphone, or tuner is connected to the proper input jack. With the volume control set fully clockwise, the oscillator trimmer is adjusted for the clearest reception in the receiver.

Additional receivers which are to be used with the *Knight* "Wireless Broadcaster" (Continued on page 111)

$R_1, R_5, R_9$ —6800 ohm,  $\frac{1}{2}$  w. res.  
 $R_2, R_8, R_{12}$ —1 megohm,  $\frac{1}{2}$  w. res.  
 $R_3$ —2.2 megohm,  $\frac{1}{2}$  w. res.  
 $R_4$ —270,000 ohm,  $\frac{1}{2}$  w. res.  
 $R_6$ —470,000 ohm,  $\frac{1}{2}$  w. res.  
 $R_7, R_{10}$ —220,000 ohm,  $\frac{1}{2}$  w. res.  
 $R_{11}$ —500,000 ohm volume control with switch ( $S_1$ )  
 $R_{13}$ —150 ohm,  $\frac{1}{2}$  w. res.  
 $R_{14}$ —4700 ohm,  $\frac{1}{2}$  w. res.  
 $R_{15}$ —33 ohm,  $\frac{1}{2}$  w. res.  
 $R_{16}$ —1000 ohm, 2 w. res.  
 $C_1$ —400  $\mu$ fd. mica capacitor  
 $C_2$ —.25  $\mu$ fd., 400 v. paper capacitor  
 $C_3$ —.01  $\mu$ fd. ceramic disc capacitor  
 $C_4, C_9$ —.005  $\mu$ fd. ceramic disc capacitor  
 $C_5$ —.02  $\mu$ fd. ceramic disc capacitor  
 $C_6$ —470  $\mu$ fd. ceramic disc capacitor  
 $C_7$ —Trimmer capacitor, 470  $\mu$ fd. maximum  
 $C_8$ —25  $\mu$ fd. mica capacitor  
 $C_{10}, C_{11}, C_{12}$ —40/40/40  $\mu$ fd., 150 v. triple section elec. capacitor  
 $J_1, J_2$ —RCA type phono jacks

$L_1$ —5.5 hy. choke, 50 ma. (*Allied Radio Corp.* Type RK-278) (or *Stancor* Type C1706, 4.5 hy., 50 ma.)  
 $L_2$ —Oscillator coil (*Allied Radio Corp.* Type RK-40)  
 $S_1$ —S.p.s.t. switch (mounted on volume control,  $R_{11}$ )  
 $SR_1$ —65 ma. selenium rectifier  
 $V_1$ —12AX7 tube  
 $V_2, V_3$ —50C5 tubes  
 $I$ —Chassis, 5 x 6 x 2 (*Allied Radio Corp.* Type RK-376) (or ICA 1546, 7 x 6 x 2, or 29081,  $5\frac{3}{4}$  x  $4\frac{7}{8}$  x  $1\frac{1}{2}$ )  
 1—9-prong wafer socket  
 2—7-prong wafer sockets  
 1—Knob  
 2—5-lug terminal strips  
 1—Line cord and plug  
 2— $\frac{3}{8}$ " rubber grommets  
 Screws, nuts, wire, solder, spaghetti  
 Total cost of separate parts, approximately \$12.00  
 (A kit containing all of the necessary parts and an instruction manual can be obtained from *Allied Radio Corp.*, 100 N. Western Ave., Chicago 80, Ill.)



## Home Broadcaster

*(Continued from page 33)*

caster" are simply tuned to the same frequency as the first receiver. The Broadcaster is then placed at its permanent location. Reception should be tried with all of the receivers, one at a time.

The antenna is unrolled as needed for

satisfactory reception with the most distant receiver. As the antenna wire is unrolled some changes in the operating frequency may take place due to the loading change on the oscillator. This is corrected by adjusting the oscillator trimmer capacitor,  $C_7$ .

If a squeal or whistle is heard in any of the receivers, the oscillator frequency may be too close to that of a broadcast or other signal. It is then necessary to select a different oscillator frequency. END

